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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,646	05/20/2005	James Fraser	BTW-094US	9673
959 7590 05/15/2007 LAHIVE & COCKFIELD, LLP ONE POST OFFICE SQUARE BOSTON, MA 02109-2127			EXAMINER PINKNEY, DAWAYNE	
			ART UNIT 2873	PAPER NUMBER
			MAIL DATE 05/15/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/535,646

Applicant(s)

FRASER ET AL.

Examiner

DaWayne A. Pinkney

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/20/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10 and 12-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 05/20/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 05/20/2005 was considered by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1, 3-8, 10 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colbourne et al. (US 5, 798, 859) in view of Dreifus (US 5, 382, 812).

The cited primary reference, Colbourne teaches, a wavelength locker for locking the wavelength of a light beam substantially to a predetermined wavelength (Column 1, lines 10-11

Art Unit: 2873

and Column 2, lines 12-14), the wavelength locker comprising at least one Fabry-Perot etalon (Column 2, lines 12-14) arranged to receive a sample portion of the light beam and to produce at least one output light beam therefrom (Column 2, lines 27-32), the intensity of which is dependent upon the wavelength of the sample light beam (Column 2, lines 27-47).

The cited primary reference does not teach the Fabry-Perot etalon comprises diamond.

The added secondary reference, Dreifus teaches, a Fabry-Perot etalon, comprising diamond (Column 2, lines 43-46, Column 2, lines 58-62 and Column 5, lines 11-17) for the benefit of diamond is a good optical window (Column 2, line 48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diamond of Dreifus in the Fabry-Perot etalon of Colbourne because diamond is a good optical window (Column 2, line 48).

Regarding **claim 3**, Colbourne discloses, a wavelength locker according to claim 1, further comprising adjustment means (Column 2, lines 54-60 and Column 3, lines 11-15), dependent upon the output of the etalon (Column 2, lines 54-60 and Column 3, lines 11-15), for adjusting the wavelength of the light beam in order to reduce or eliminate a drift from the predetermined wavelength (Column 2, lines 54-60 and Column 3, lines 11-15).

Regarding **claim 4**, Colbourne discloses, a wavelength locker or drift detector according to claim 3, wherein the adjustment means comprise control electronics (Column 2, lines 54-60 and Column 3, lines 11-15).

Regarding **claim 5**, Colbourne discloses, a wavelength locker according to claim 3, wherein the adjustment means is arranged to control a light source that generates the light beam (Column 2, lines 54-60 and Column 3, lines 11-15).

Regarding **claim 6**, Colbourne discloses, a wavelength locker according to claim 5, wherein the light source is remote from the wavelength locker, and the adjustment means transmits a control signal to the light source to adjust the wavelength of the light beam (Column 2, lines 54-60 and Column 3, lines 11-15).

Regarding **claim 7**, Dreifus discloses, a wavelength locker according to claim 5, wherein the light source comprises a part of the wavelength locker or drift detector (Column 2, lines 56-62).

Regarding **claim 8**, Colbourne discloses, a wavelength locker according to claim 1, wherein the light beam comprises an optical signal, and the sample portion of the light beam comprises a sample portion of the optical signal (Column 3, lines 21-28 and Column 3, lines 37-44).

Regarding **claim 10**, Colbourne discloses, a wavelength locker according to claim 5, wherein the light source comprises a laser (Column 2, lines 12-14).

Regarding **claim 28**, Colbourne discloses, an optical signal transmitter comprising a wavelength locker according to claim 8 (Column 1, lines 18-28), the optical signal transmitter including a light source, which generates the optical signal (Column 2, lines 12-14).

6. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colbourne et al. (US 5, 798, 859) in view of Dreifus (US 5, 382, 812) as applied to claim 1 above, and further in view of Caprara et al. (US 7, 180, 928).

The cited previous combination of Colbourne in view of Dreifus remains as applied to claim 1 above.

Art Unit: 2873

The cited combination does not teach the diamond comprises a single crystal diamond.

The added tertiary reference, Caprara teaches, an etalon which uses a single crystal diamond (Column 22, lines 5-7) for the benefit of it helps to produce a high-quality beam (Column 4, line 11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the single crystal diamond of Caprara with the combination of Colbourne in view of Dreifus because the single crystal diamond of Caprara helps to produce a high-quality beam (Column 4, line 11).

Regarding **claim 13**, Caprara teaches, a wavelength locker according to claim 1, wherein the diamond is a synthetic diamond (Column 22, lines 5-7).

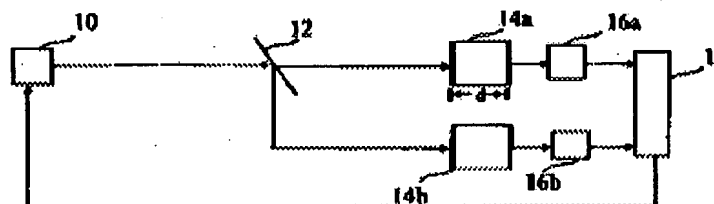
Regarding **claim 14**, Caprara teaches, a wavelength locker according to claim 13, wherein the diamond has been formed by chemical vapor deposition (Column 22, lines 5-7).

Regarding **claim 15**, although Caprara does not teach the diamond is substantially free from defects. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a diamond that is substantially free from defects because this would allow the system to produce sharper beams and would allow the beam to be transmitted through the etalon more efficiently.

Regarding **claim 16**, Colbourne teaches, a wavelength locker according to claim 1, wherein the etalon comprises a partially-reflective input face and an opposite partially-reflective output face, separated by a thickness of the etalon (Column 3, lines 42-45).

Art Unit: 2873

Regarding **claim 17**, Colbourne teaches, a wavelength locker according to claim 16, wherein the input and output faces are substantially flat and lie in substantially parallel planes (surfaces of 14a in Fig. 1).

**Fig. 1**

Regarding **claim 18**, although Caprara does not teach the input and output faces are polished. It would have been obvious to one of ordinary skill in the art at the time the invention was made polish the input and output faces of the wavelength locker because this would allow the system to produce sharper beams and would removed any unwanted flaws in the surfaces which would in turn allow the beam to be transmitted through the etalon more efficiently.

Regarding **claim 19**, Dreifus teaches, a wavelength locker according to claim 16, wherein the thickness of the diamond etalon is at least 0.1 mm (Column 4, lines 16-18).

Regarding **claim 20**, Dreifus teaches, a wavelength locker according to claim 16, wherein the thickness of the diamond etalon is at least 0.1 mm (Column 4, lines 16-18).

Regarding **claim 21**, Dreifus teaches, a wavelength locker according to claim 16, wherein the thickness of the diamond etalon is no greater than 5.0 mm (Column 4, lines 16-18).

Regarding **claim 22**, Dreifus teaches, a wavelength locker according to claim 20, in which the diamond etalon has a thickness in the range 1.0 mm to 1.5 mm (Column 4, lines 16-18).

Art Unit: 2873

7. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colbourne et al. (US 5, 798, 859) in view of Dreifus (US 5, 382, 812) as applied to claim 1 above, and further in view of Hoose et al. (US 6, 693, 925).

The cited previous combination of Colbourne in view of Dreifus remains as applied to **claim 1 above**.

The cited combination does not teach the etalon has transmitted and reflected wavelength dependent output characteristics, each of which has a free spectral range of 2X GHz, allowing wavelength-locking points at spacings of both 2X GHz and X GHz.

The added tertiary reference, Hoose teaches, an etalon, which has transmitted and reflected wavelength dependent output characteristics (Column 2, lines 65-67 and Column 3, lines 1-6), each of which has a free spectral range of 2X GHz (Column 4, lines 47-52), allowing wavelength-locking points at spacings of both 2X GHz and X GHz (Column 4, lines 47-52) for the benefit of this would simplify the system design and reduce costs of the system (Column 2, lines 18-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the free spectral range of Hoose with the combination of Colbourne in view of Dreifus because the free spectral range of Hoose simplifies the system design and reduce costs of the system (Column 2, lines 18-19).

Regarding **claim 24**, Hoose teaches, a wavelength locker according to claim 23, wherein wavelength locking points at spacings of X GHz are determined by a difference between the

Art Unit: 2873

transmitted and reflected wavelength dependent output characteristics of the etalon (Column 2, lines 18-19).

Regarding **claim 25**, Hoose teaches, a wavelength locker according to claim 24, wherein the amplitude of the difference between the transmitted and reflected wavelength dependent output characteristics of the etalon is preset such that the wavelength locking points are X GHz apart (Column 2, lines 18-19).

Regarding **claim 26**, Hoose teaches, a wavelength locker according to claim 23, wherein X is 25 (Column 2, lines 18-19).

8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 6, 411, 634) in view of Dreifus (US 5, 382, 812).

The cited primary reference, Zhang teaches, a wavelength drift detector (Column 1, lines 7-9) for detecting the drift of the wavelength of a light beam from a predetermined wavelength (Column 5, lines 22-39), the wavelength drift detector comprising at least one Fabry-Perot etalon (Column 1, lines 20-23) arranged to receive a sample portion of the light beam to produce at least one output light beam therefrom (Column 3, lines 13-15), the intensity of which is dependent upon the wavelength of the sample light beam (Column 4, lines 54-65).

The cited primary reference does not teach the Fabry-Perot etalon comprises diamond.

The added secondary reference, Dreifus teaches, a Fabry-Perot etalon, comprising diamond (Column 2, lines 43-46, Column 2, lines 58-62 and Column 5, lines 11-17) for the benefit of diamond is a good optical window (Column 2, line 48).

Art Unit: 2873

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diamond of Dreifus in the Fabry-Perot etalon of Zhang because diamond is a good optical window (Column 2, line 48).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mazed (US 6, 931, 038) teaches a wavelength locker with a Fabry-Perot etalon with diamond supports.

Tatsuno et al. (US 6, 597, 712) teaches a wavelength locker with a Fabry-Perot etalon.

Villeneuve et al. (US 5, 825, 792) teaches a wavelength locker with a Fabry-Perot etalon.

Jordan et al. (US 2002/0126386) teaches a wavelength locker with a Fabry-Perot etalon.

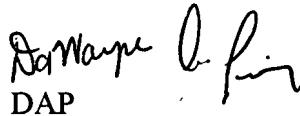
Utz et al. (US 6, 951, 827) teaches a Fabry-Perot etalon which comprises diamond.

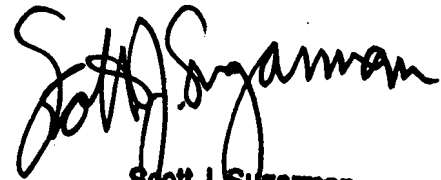
Any inquiry concerning this communication or earlier communications from the examiner should be directed to DaWayne A. Pinkney whose telephone number is (571) 270-1305. The examiner can normally be reached on Monday-Thurs. 8 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2873

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


DAP


Scott J. Sugarman
Primary Examiner